




Research Article

Retrospective Investigation of Prevalence and Trends of STDs in Public Health Facilities in the Tigray Regional State, Ethiopia from July 2019-June 2020

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Abstract

There is a significant and rising occurrence of major treatable sexually transmitted infections (STIs) in sub Saharan Africa, particularly in Ethiopia. The engagement of teenagers in sexual activities without parental oversight continues to pose a public health threat. This study seeks to evaluate the prevalence and trends of significant treatable STIs within our region. *Methods:* 3,500 patients with STI symptoms who were seen in all medical facilities between July 2019 and June 2020 were included in a retrospective cross-sectional study with descriptive statistics analysis to compare prevalence and trend measures by age group, sex, and month. Tables and bar graphs were used to present the results. *Result:* The data indicated a higher prevalence of STIs among males compared to females. The sexually active adult population exhibited a notable incidence of sexually transmitted diseases, with 52.7% of cases being male and 47.3% female. The specific STIs identified included genital candidiasis at 18.3%, hepatitis B at 16.9%, gonorrhea at 16.3%, hepatitis C at 13.6%, syphilis at 11.8%, genital herpes at 8.8%, genital warts at 7.5%, and Chlamydia at 6.8%. The incidence of syphilis showed an increase from 2.2% to 4.2% in 2020, while the trends for other STIs were more variable. *Conclusion:* Sexually transmitted diseases predominantly impact adults, with prevalence rates differing by gender and age group, and exhibiting a non-linear trend across most age categories. These findings offer essential insights into the epidemiological landscape of the country, suggesting the need for future prevention strategies that target adults at the highest risk for sexually transmitted infections.

Keywords

Sexually Transmitted Disease, Prevalence, Trend, Public Health Facility

1. Introduction

Sexually transmitted infections (STIs) pose a considerable health and economic challenge for developing countries [1].

These nations are responsible for 75 to 85% of the estimated 340 million new cases of treatable STIs annually, and STIs

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contribute to 17% of the economic losses resulting from illness [2]. Young people are considered a vulnerable group for acquiring STIs due to engaging in Risky Sexual Behaviors (RSBs), such as early initiation of sexual activity, inconsistent or improper use of condoms, having multiple sexual partners, and the use of alcohol or drugs. Furthermore, social changes associated with entering the university environment can contribute to an increase in these risky behaviors [3]. From an epidemiological perspective, STIs pose a significant issue for the sexual and reproductive health of young people, potentially leading to complications such as infertility, pelvic inflammatory diseases, cervical cancer, and infections in newborns. One of the most effective strategies for preventing new infections is the consistent use of condoms. [4].

There is in grates of sexually transmitted diseases continue to exact a significant cost from growing numbers of adolescents as well as from society [5]. Sexually transmitted infections (STIs) significantly affect sexual and reproductive health by contributing to stigmatization, infertility, various cancers, and complications during pregnancy [6]. Sexually transmitted diseases (STDs) are a major public health problems among young people and can lead to the spread of HIV [7]. Untreated sexually transmitted diseases (STDs) have been associated with complications such as negative pregnancy and perinatal outcomes [8]. Evidence from these studies indicates that screening for and treating chlamydia is a significant and beneficial measure to lower the risk of pelvic inflammatory disease (PID) in young women [9].

In Ethiopia, 3% female and 1% male adolescents aged 15-24 reported having an STI, highlighting the uneven distribution and concentration of STIs in resource-poor communities [10]. There is an attempt to estimate the burden of many diseases according to age, gender, and geographical location in different parts of the world from 1990 to 2019 [1]. The prevalence of sexually transmitted infections (STIs) differs significantly across various regions globally, with notably higher rates observed in low-income countries such as Ethiopia [11]. The World Health Organization's Global Health Strategy on sexually transmitted infections for the years 2016 to 2021 seeks to collect data regarding the prevalence and incidence of sexually transmitted diseases within representative populations. Sexually transmitted diseases represent a significant health concern, predominantly impacting young individuals in both developing and developed nations [12]. There is still an unacceptably high global incidence of sexually transmitted infections (STIs). Around the world, more than a million STIs are acquired every day [13]. Sexually transmitted infections (STIs) are widespread and can lead to a variety of health issues. Nevertheless, many of these infections often go unnoticed due to the absence of clear signs or symptoms. Asymptomatic infections are particularly concerning because they can result in long-term consequences, especially for women, and pose risks of complications during pregnancy, including the possibility of transmission from mother to child [14].

Progress has been made in the development and introduction of vaccines against certain sexually transmitted diseases such as hepatitis B and human papilloma virus. The development of a rapid point-of-care test for syphilis has opened the door to controlling this infection [15]. Despite extensive studies on preventing sexually transmitted diseases in adolescents, there is inconsistent prevalence data and trend of these diseases. So that Studying the Prevalence and trends in STD in different setups is crucial for area-specific evidence-based interventions. Therefore; the aim of this review was to determine the prevalence and trend of sexually transmitted diseases in the population attending a health facility in Tigray.

2. Methods

2.1. Study Design

This study was a retrospective data analysis that evaluated prevalence and estimated monthly percentage changes to quantify trends in age-standardized prevalence of sexually transmitted infections among screened patients. The analysis, covering July 2019 to June 2020, used data from a monthly reporting system across all health facilities in the region. Screening involved assessing signs and symptoms of STIs through patient interrogation at each facility. The data, collected from all health facilities and stored in the regional health data base, was deemed high quality based on evaluations conducted in 2019-2020, which showed that a high proportion of facilities met acceptable standards for data quality across various indicators.

2.2. Study Population and Period

All patients presenting with symptomatic STI diagnoses at health facilities from July 2019 to June 2020 were included.

2.3. Data Collection Procedure

Data were electronically recorded in the Health Management Information System and transferred to Excel from the health system's data base collection form. The collected data included the number of patients screened and they ears of screening, covering the 2019–2020 periods. The study focused on the number of cases of sexually transmitted infections. The region is divided into seven zones with 94 provinces, consisting of 10 urban districts and varying numbers of semi-urban and rural districts. The health system includes both public and private facilities, with overall cover age reaching 90%. It features on specialized referral hospital, 16 general hospitals, 22 primary hospitals, and 224 government-owned health centers.

2.4. Eligibility Criteria

2.4.1. Inclusion

All patients who visited STI clinics and whose diagnostic results were completely captured in the HMIS dataset were taken for the study.

2.4.2. Exclusion

Patient recordings having a degraded record or missing data were excluded from the study.

2.4.3. Data Analysis

Data was entered into Excel version 10 and exported to SPSS version 14 for analyses. A descriptive analysis was performed and presented in frequencies and proportions using tables and figures.

3. Result

The study covers sexually transmitted diseases, revealing that 1,657 cases (47.3%) were found in females and 1,843 cases (52.7%) in males, indicating a higher prevalence among men. Of 3,500 skin disease cases, 16.3% were linked to gonococcal infections, with 61.4% in men and 38.6% in women, showing a male predominance. Gonococcal prevalence was highest in the 15-29 and 30-64 age groups. In chil-

dren (ages 1-14), 16.6% of male cases and 8.2% of female cases had gonococcal infections, while in adults (15-34 and older), 44.7% of males and 30.4% of females were affected, indicating a higher prevalence in adult males. For genital candidiasis, 18.3% of the 3,500 skin diseases were related, with 40.1% in men and 59.9% in women, showing a female predominance. Candidiasis prevalence increased with age in the 15-29 and 30-64 groups. In children, 14% of males and 14.8% of females had candidiasis, while in adults; the rates were 26.05% for males and 45.08% for females, suggesting a higher prevalence among adult females.

Among the 3,500 skin diseases, 11.8% were associated with syphilis, with 37.8% in men and 62.2% in women, indicating a slight female predominance. Syphilis prevalence was highest in the 30-64 and 15-29 age groups, followed by those over 35 and 1-14 years old. In children (ages 1-14), 0.72% of males and 1.2% of females were affected, while in adults (15-34 and older), 37.05% of males and 61.02% of females had syphilis, showing higher rates in adults compared to children. For Chlamydia infection, which also constituted 11.8% of the cases, 35.4% were in men and 64.6% in women, with a slight female predominance. Chlamydia prevalence was highest in the 30-64 and 15-29 age groups, followed by those over 35 and 1-14 years old. In children (ages 1-14), 2.1% of males and 5.1% of females had chlamydia, while in adults (15-34 and older), 33.3% of males and 59.5% of females were affected, demonstrating higher prevalence in adult females compared to child females.

Table 1. Prevalence of Bacterial Infection Cause of Disease Transmitted Through Sexual Contact by Age and Gender in Health Facilities between July 2019 and June 2020.

Age group	Chlamydia infection		Syphilis		Gonococci infection		candidiasis	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
1-14 male	5	2.1	3	7	95	16.3	90	14
15-29 male	24	10.1	42	10.2	128	39	83	12.9
30-34 male	41	17.3	91	22	82	14.3	70	10.9
>35 male	14	5.9	20	4.8	46	8	14	2.2
1-14 female	12	5.1	5	1.2	47	8.2	95	14.8
15-29 female	58	24.5	142	34.4	83	14.5	164	25.6
30-34 female	76	32.1	103	24.9	53	9.3	113	17.6
>35 female	7	3	7	1.7	38	6.6	12	1.9
Total	237	6.8	413	11.8	572	16.3	641	18.3

Among the 3,500 skin diseases, 8.7% were due to genital herpes, with 53.4% in women and 46.6% in men, indicating a slight female predominance. Herpes prevalence increased

most in the 15-29 and 30-64 age groups, with lower rates in the 1-14 and over 35 age groups. In children ages 1-14, 10.7% of males and 8.1% of females had genital herpes. In

adults (15-34 and older), 42.6% of men and 38.4% of women were affected, showing higher prevalence in adults compared to children. For genital warts, which constituted 7.4% of the cases, 51.1% were in men and 48.9% in women, with a slight male predominance. Genital warts were most prevalent in the 15-29 and 30-64 age groups, with lower rates in the 1-14 and over 35 age groups. In children ages 1-14, 5.5% of males and 6.5% of females had genital warts. In adults (15-34 and older), 45.6% of males and 27.4% of females were affected, showing higher prevalence in adult males compared to children. Hepatitis C was present in 13.6% of cases, with 66.2% in men and 33.8% in women, indicating a male predominance. Hepatitis C prevalence was highest in the 30-34 and

15-29 age groups, with lower rates in the 1-14 and over 35 age groups. In children ages 1-14, 1.67% of males and 0.42% of females had Hepatitis C. In adults (15-34 and older), 64.4% of males and 33.5% of females were affected, reflecting higher rates in adult males compared to children. Hepatitis B was found in 16.8% of cases, with 66.2% in men and 33.8% in women, also showing a male predominance. Hepatitis B prevalence was highest in the 30-34 and 15-29 age groups, with lower rates in the 1-14 and over 35 age groups. In children ages 1-14, 16.6% of males and 8.1% of females had Hepatitis B. In adults 15-34 and older, 27.1% of males and 31.3% of females were affected, indicating higher prevalence in adult males compared to children.

Table 2. Prevalence of Viral Cause of Disease Transmitted Through Sexual Contact by Age and Gender in Health Facilities between July 2019 and June 2020.

Age group	Genital Herpes		Hepatitis B		Genital warts		Hepatitis C	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
1-14 male	33	10.7	98	16.6	17	6.5	8	1.7
15-29 male	58	18.9	67	11.3	86	33	87	18.2
30-34 male	55	17.9	147	24.9	48	18.4	184	38.5
>35 male	18	5.9	46	7.8	6	2.3	37	7.7
1-14 female	25	8.1	48	8.1	20	7.7	2	4
15-29 female	62	20.2	57	9.6	58	22.2	30	6.3
30-34 female	52	16.9	83	14	24	9.2	110	23
>35 female	4	1.3	45	7.6	2	8	20	4.2
Total	307	8.7	591	16.8	261	7.4	478	13.6

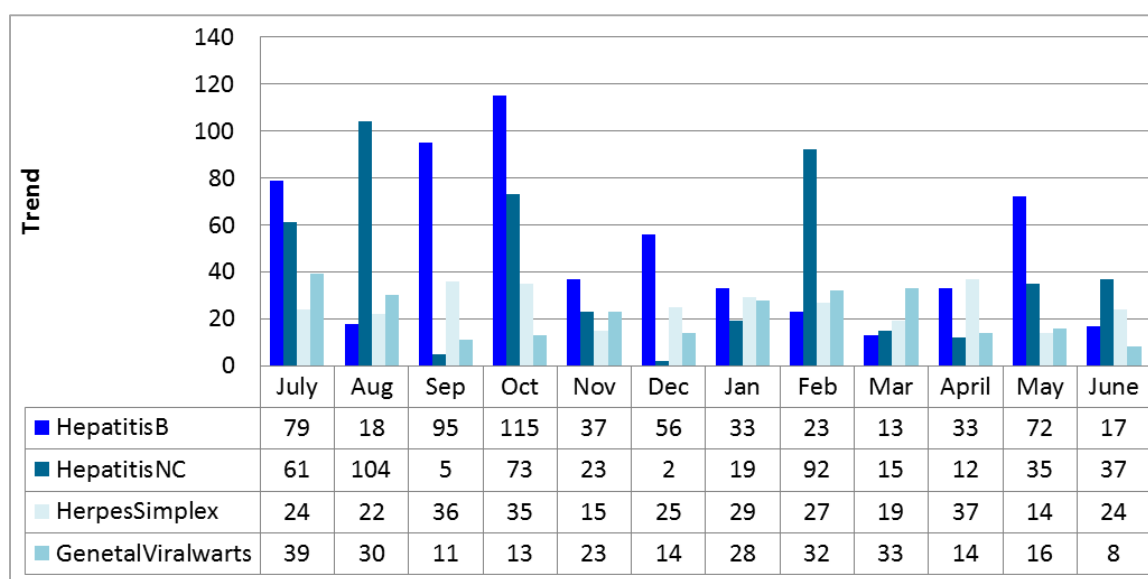


Figure 1. Monthly trends of viral sexually transmitted diseases from June 2019 to July 2020.

Hepatitis B prevalence was highest in October and lowest in December 2020. The decline in sexually transmitted infections was most pronounced between February and March, with rates falling from October to December for Hepatitis B. August saw elevated rates for both Hepatitis C and genital warts. By the end of November 2020, there was a notable decrease in Hepatitis B cases in November, Hepatitis C cases in September, genital herpes cases in May, and genital warts cases in September (see Figure 2). Significant differences were observed between genders and age groups regarding the prevalence of sexually transmitted infections. Overall, the prevalence of viral sexually transmitted infections in the region showed intermittent trends from July 2019 to June 2020, as illustrated in Figure 1.

The highest rate of sexually transmitted diseases was recorded in February, with a peak in syphilis cases, while the

lowest was in October with a Chlamydia case. A decrease in sexually transmitted infections was observed between July and August. Increases were noted from March to August for genital candidiasis, February to March for syphilis, October to November for gonococci, and November for Chlamydia. Syphilis showed an increase compared to the baseline by the end of the year. Over the one-year period (September to June 2020), there was a sharp decline in genital candidiasis (December), Chlamydia (November), gonococci (May), and genital warts (September). Although the monthly decreases in STIs were not statistically significant, women generally had a lower prevalence of STIs compared to men. The prevalence trends in the graph (Figure 2) demonstrated intermittent bacterial and fungal STIs in the region from July 2019 to June 2020, with syphilis cases increasing from 2.2% to 4.1% during this period (see Figure 2).

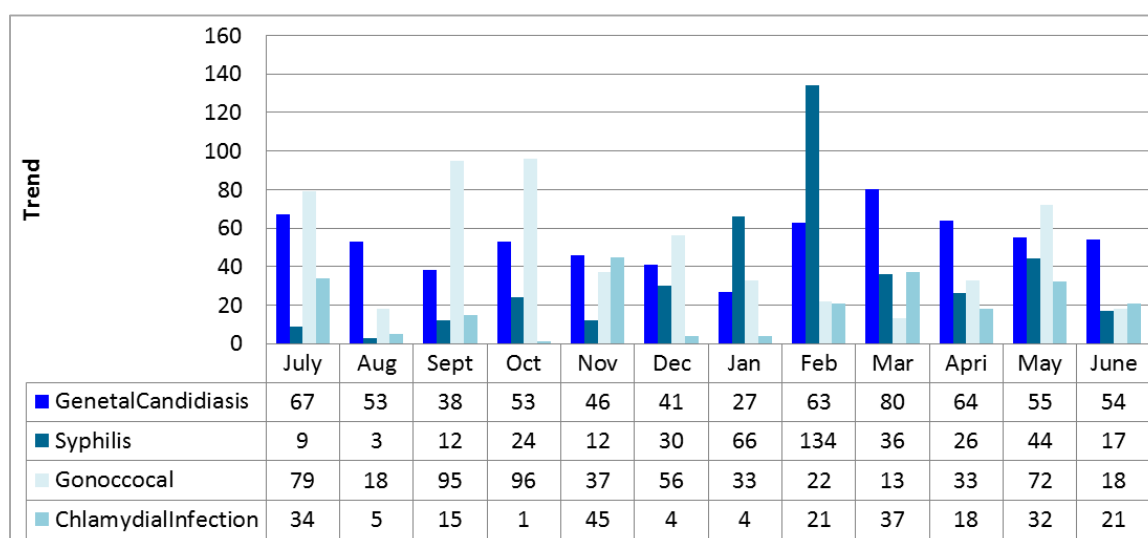


Figure 2. Monthly trends of Bacterial and fungal transmitted disease by sexual contact from June 2019-July, 2020.

4. Discussion

Sexually transmitted infections (STIs) pose significant health, social, and financial challenges [16]. This study aimed to evaluate the prevalence of STDs in the general population at tending various health facilities from July 2019 to June 2020, categorized by age and sex, based on a one-year data base. Our findings indicate a relatively high prevalence of STDs in this population, with the following rates: genital candidiasis (18.3%), hepatitis B (16.9%), gonococci (16.3%), hepatitis (13.6%), syphilis (11.8%), genital herpes (8.8%), genital warts (7.5%), and chlamydia infection (6.8%). Notably, syphilis prevalence increased over the year, whereas other STDs decreased from 2019 to 2020, with adults being more affected than children.

The prevalence rates for hepatitis B and C in our study

were 16.9% and 13.6%, respectively, which are higher than the 3.57% and 2.13% reported in Ethiopia [17]. This discrepancy may be due to differences in sample sizes. However, our rates are lower compared to Europe, where hepatitis B and C prevalence is reported at 23.4% and 31.2%, respectively, likely due to variations in study design and sample size. Our study also found higher prevalence hepatitis in males, consistent with reports from Kazakhstan [18].

Genital herpes prevalence in our study was 8.8%, lower than with findings from western countries, [4] Australia and New Zealand; Pooled mean proportion of HSV-1 detection in genital herpes was 30.5% in Austria and new Zealand [19], in Brazil 15.6% [20]. This variation could be due to differences in sample size, diagnostic methods, or study locations [21]. Genital warts prevalence was 7.4% in our study area, which is lower than in this study genital wart prevalence 9.2% [22] which is higher than the 1.07% reported in India

[23]. Our result show that chlamydia infection prevalence is 6.8% which is higher than in Pemba Island Tanzania result; *C. trachomatis* (4.6%) [24], suggesting geographical, behavioral, or viral differences. Chlamydia prevalence in our study was lower than the 7.8% reported in Sub-Saharan Africa [25] but similar with overall chlamydia prevalence in Hawassa [26]. These differences may be attributed to variations in diagnostic methods and sample sizes.

Syphilis prevalence was 11.8%, which is higher than the prevalence in sub-Saharan African countries with over all prevalence of 1.01% [27] as well as the result found in Venezuelan refugees Colombia, 4.6% in women and 5.8% men [28]. Our study found gonococci prevalence at 16.3%, which is higher than the 7.6% found in Sub-Saharan Africa among sex 9% [29], in Ethiopia; 12.2% [30]. The discrepancies might be due to differences in diagnostic criteria and sample sizes. But lower than in Lebanon [31], indicating generally high rates. The prevalence of STDs showed in consistent trends with South Ethiopia [32]. Our study indicates that STDs are most common among individuals aged 15-29 [33], a notable decline in the incidence of sexually transmitted diseases has been observed in Athens, Greece [34].

Strength and weakness

The strength of a retrospective review is its capacity to collect and generalize data from a large patient population. However, its limitation is the potential issue of missing data.

5. Conclusion

Sexually transmitted infections were widespread in this area, affecting individuals across all age groups and genders. STIs can significantly impact the burden of disease at both individual and community levels. By understanding the trends and prevalence of STIs, we can better implement interventions in the region and allocate resources effectively for STI prevention. This strategy aims to lower STI rates and target high-risk individuals with prevention services to reduce the risk of acquiring and spreading STIs, particularly in populations experiencing high levels of stigma. Further research is needed to assess the state of STIs following the collapse of the health system in this region over the past three years.

Abbreviations

STD	Sexual Transmitted Disease
HMIS	Health Information System
STIs	Sexually Transmitted Infections
TRHB	Tigray Regional Health Bureau

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Author Contributions

Mulugeta Tilahun Gebremedhin: Conceptualization, Data curation, Formal analysis, Project administration, Supervision, Validation, Writing – original draft

Ataklti Gessesse Teka: Methodology, Project administration, Supervision, Validation, Visualization, Writing – original draft

Gebrecherkos Teame Gebrehiwot: Validation, Writing – review & editing

Mesfin Tesfay Zelalem: Writing – review & editing

Girmay Alemseged Kahsay: Writing – review & editing

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Data Availability Statement

The datasets generated and/or analyzed during the current study are not publicly available because of the sensitive nature of the data but are accessible from the corresponding author at a reasonable request.

Conflicts of Interest

The authors declare no competing interests relevant to this manuscript.

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